

Enbridge Line 21 Segment Replacement Project

Project completion key facts

Background

Enbridge operates Line 21 (the Norman Wells Pipeline), which carries crude oil 870 kilometres (km) from Norman Wells, Northwest Territories to Zama, Alberta, where it enters a third-party pipeline system and is sent on to Edmonton. In November 2016, Enbridge shutdown Line 21 as a precautionary measure to investigate and address slope instability near the Mackenzie River crossing approximately 10 km east of Fort Simpson. After receiving regulatory approval, Enbridge used horizontal directional drilling (HDD) to install a new 2.5 km segment of pipe and decommissioned the existing segment that crosses the Mackenzie River. In September 2018, Enbridge reactivated the Line 21 pipeline.

- The sole purpose of the project was to resume safe operation of the existing Line 21 under exactly the same operating conditions.
- The project was executed safely, and in partnership with local communities.
- Safety is Enbridge's top priority. We are committed to providing safe and reliable energy infrastructure, to meet or exceed regulatory and community standards.
- Our preventative maintenance program includes around-the-clock monitoring of pipeline flow, inline inspections and aerial patrols.
- Enbridge operates under strict regulatory oversight to ensure safety and protection of the environment.

What has changed?

- The new pipeline segment is much deeper under the Mackenzie river than the old line to protect it from potential landslides on the banks of the river.
- The new pipeline segment under the river has a wall thickness that is 25% thicker.
- The new pipeline segment is tested, certified, and approved by the National Energy Board (NEB) as safe to operate at a maximum pressure limit of 9930 Kilopascal (kPa).

- Enbridge has requested that the NEB adjust the previously-approved pressure limit of the old pipeline crossing to account for the depth of the new pipeline segment. The pipeline pressure limit only needs to be increased for the new segment due to the lower elevation of the pipeline under the river.

In normal operations, the operating pressure of the new segment would not exceed the current pressure limit, but in the unlikely event of a short-lived surge of pressure (caused, for example, by a valve malfunction), the pressure at the lowest point in the pipeline could exceed the old pressure limit. See Table 1 for a list of pressure limits applicable to the Line 21 pipeline.

Pressure Limits approved by the NEB

Pipeline Segment	Operating Pressure Limit (kPa)
Norman Wells to Wrigley	7735
Wrigley to south side of Mackenzie River crossing	5723
Mackenzie River crossing – new pipeline segment	9930 (requested)
North side of Mackenzie River crossing to Mackenzie Highway	5723
Mackenzie Highway to Zama	4744

Reactivation of the pipeline

The pipeline reactivation was a carefully planned and phased process that was successfully executed in collaboration with Imperial Oil Limited, the primary shipper for the Line 21 pipeline.

During reactivation, Enbridge paid careful attention to what was happening along the pipeline. Aerial surveys were flown to visually confirm that there were no changes to the condition of the right-of-way as a result of reactivation. Enbridge was prepared to act if any changes such as slope movements were identified, but nothing adverse was noted.

In addition to right-of-way monitoring, Enbridge personnel checked all of the pipeline valves and facilities, and visually monitored the pressure in the pipeline. The pipeline was reactivated safely and without incident.